

CLAIMS

1. A triptycene analog comprising a compound of formula:

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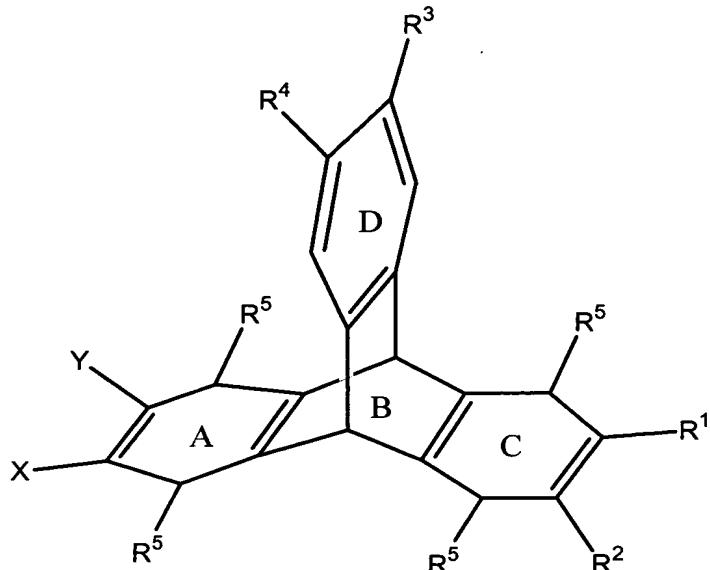
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wherein

X is selected from the group consisting of: H, R, SR and NR;

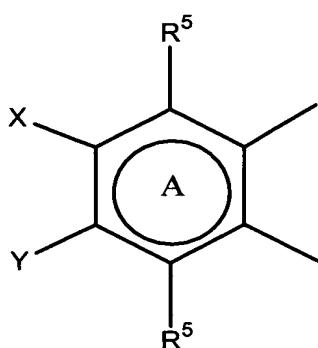
Y is selected from the group consisting of: halogen, R, NR2, SR and H;

R and R¹⁻² are independently selected from the group consisting of: H, halogen, OR, and hydrocarbyl;

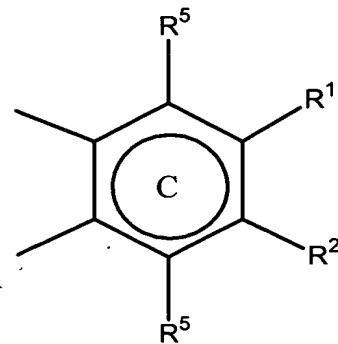
R³⁻⁴, independently of one another, are selected from the group consisting of: H, bromine, R, SR, and NR₂;

R⁵, independently of other R⁵'s, is selected from the group consisting of: =O, =N-OH and =CHR; and reduced forms thereof, wherein in reduced forms, either ring A or ring C or both is replaced with

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or



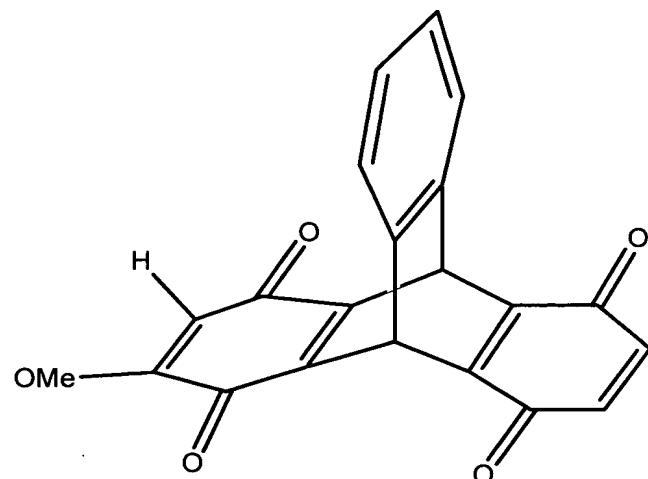
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and wherein in reduced forms, each R⁵ is independently H, C1-C8 alkyl or -OR; and pharmaceutically acceptable salts of the foregoing, as well as optical isomers thereof.

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2. The triptycene analog of claim 1 having the formula:

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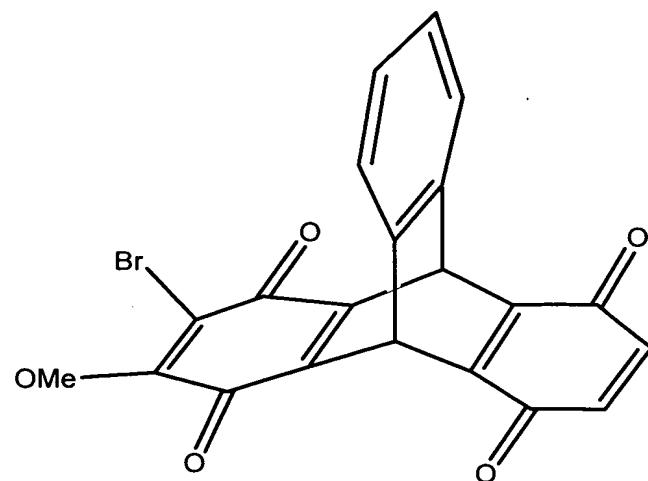
3. The triptycene analog of claim 1 having the formula:

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4. The triptycene analog of claim 1, wherein:

X is selected from the group consisting of: H, OMe and CO₂Me;

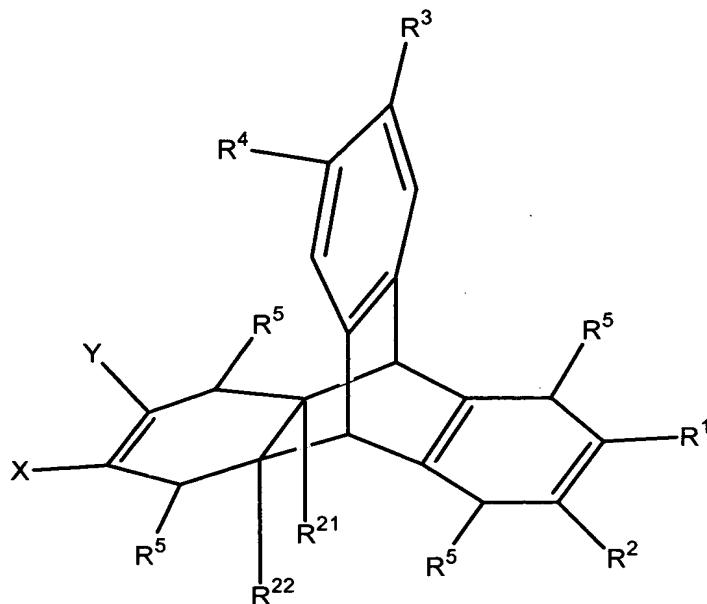
Y is selected from the group consisting of: H, Br, and OMe;

R¹, R², R³ and R⁴ are all H; and

5 R⁵ is, independently of other R⁵'s, selected from the group consisting of: OH, OMe, =O, and H.

5. A triptycene analog having the formula:

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wherein

X is selected from the group consisting of: H, R, SR and NR₂

35 Y is selected from the group consisting of: halogen, NR₂, R, SR and H;

R and R¹⁻², are independently selected from the group consisting of: H, halogen, OR, and hydrocarbyl;

R³⁻⁴, independently of one another, are selected from the group consisting of: H, bromine, R, SR, and NR₂;

40 R⁵, independently of other R⁵'s, is selected from the group consisting of: =O, =N-OH, and =CHR;

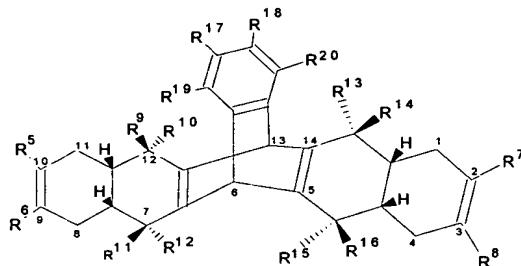
R²¹ and **R²²** are independently selected from the group consisting of: H, R, and OR; and reduced forms thereof and pharmaceutically acceptable salts of the foregoing, as well as optical isomers thereof.

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6. A triptycene analog having the formula:

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wherein

R⁵ is selected from the group consisting of: R, halogen, NR₂, SR, and H;

R⁶ is selected from the group consisting of: H, R, SR and NR₂;

R⁷ and **R⁸** are independently selected from the group consisting of: H, halogen, and hydrocarbyl;

R¹⁷ and **R¹⁸** are independently selected from the group consisting of: H, bromine, R, SR, and NR₂;

R¹⁹ and **R²⁰** are, independently of one another, H, R, or OR;

(R⁹ and R¹⁰) and (R¹¹ and R¹²) and (R¹³ and R¹⁴) and (R¹⁵ and R¹⁶) are independently together =O or are independently H or -OR;

R is selected from the group consisting of: H, halogen, OR, and hydrocarbyl; and reduced forms thereof;

and pharmaceutically acceptable salts of the foregoing, as well as optical isomers thereof.

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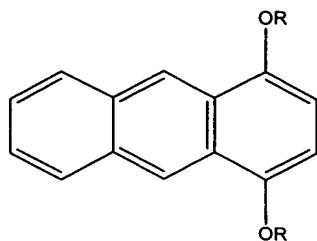
7. A method of making a compound of claim 1, comprising:

heating an optionally substituted anthracene with an optionally substituted quinone with silver oxide.

8. The method of claim 7, further comprising adding zinc iodide.

9. The method of claim 7, wherein the optionally substituted anthracene has the formula:

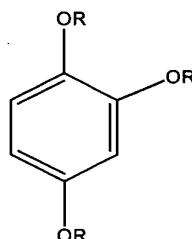
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and the optionally substituted quinone has the formula:

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where R is H or hydrocarbyl.

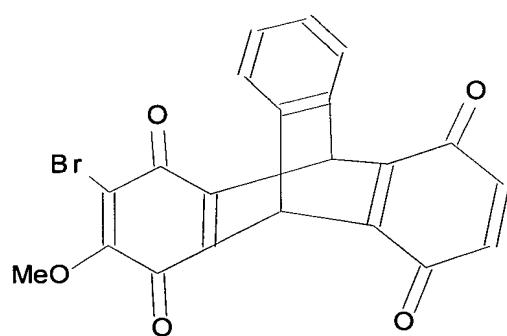
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10. A method of brominating a triptycene derivative by reacting a triptycene derivative with N-bromosuccinimide.

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11. The method of claim 10, wherein the triptycene derivative is:

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12. A method of inhibiting nucleoside transport, inducing DNA fragmentation, inhibiting nucleic acid synthesis, inhibiting protein synthesis, decreasing the proliferation of cancer cells or decreasing the viability of cancer cells comprising administering an effective amount of a compound of claim 1 to a patient.

13. A method of treating cancer in a host, comprising administering to said host a therapeutically effective amount of a compound of claim 1 for an effective time.

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14. A triptycene analog of claim 1,

wherein at least one of X, Y, R¹ and R² is selected from the group consisting of: a nitrogen containing group, a water soluble group, and a sulfur containing group.

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15. The compound of claim 14, wherein X is -NR₂.

16. The compound of claim 14, wherein R² is -NR₂.

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17. The compound of claim 16, wherein R² is -NMe₂.

18. The compound of claim 14, wherein at least one of X, Y, R¹ and R² is selected from the group consisting of: amine, amino acid and amine sugar.

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19. The compound of claim 14, wherein X is -NH-(CH₂)_n-CO₂R, where n is an integer from 0 to 8, and R is as defined in claim 14.

20. The compound of claim 19 wherein R is H.

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21. The compound of claim 14, wherein one or more of X, Y, R¹ and R² contains an optionally substituted nitrogen containing hydrocarbyl group.

22. The compound of claim 21, wherein the optionally substituted nitrogen containing hydrocarbyl group is a fused ring structure.

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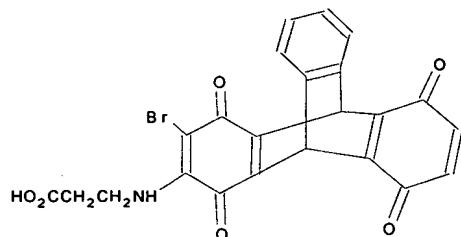
23. The compound of claim 14, wherein X is a sulfur containing group.

24. The compound of claim 23, wherein the sulfur containing group also contains one or

more N atoms.

25. The compound of claim 14 having the formula:

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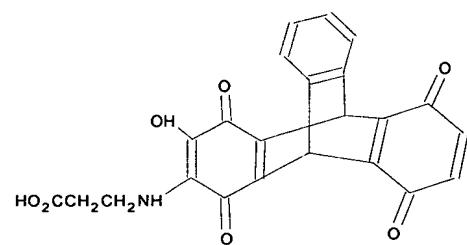


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26. The compound of claim 14 having the formula:

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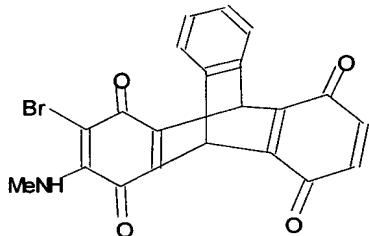
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27. The compound of claim 14 having the formula:

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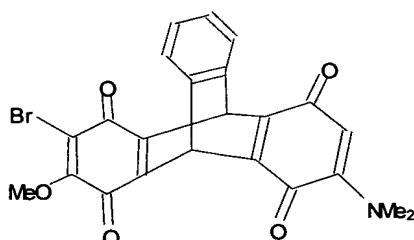


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28. The compound of claim 14 having the formula:

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29. The compound of claim 14 having the formula:

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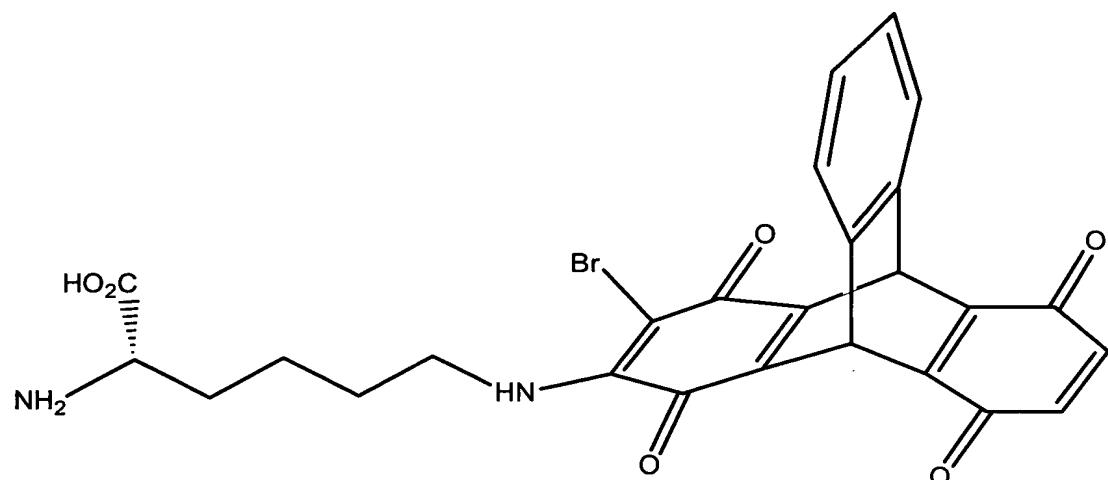
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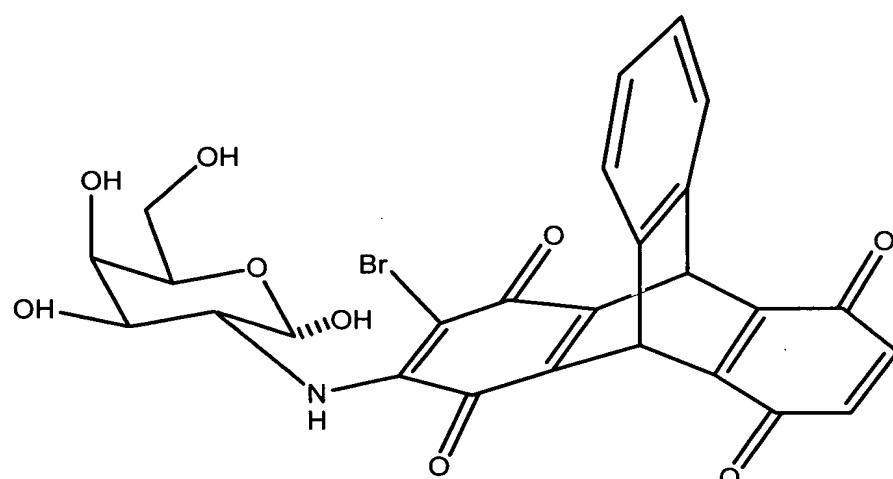
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30. The compound of claim 14 having the formula:



31. The compound of claim 14 having the formula:

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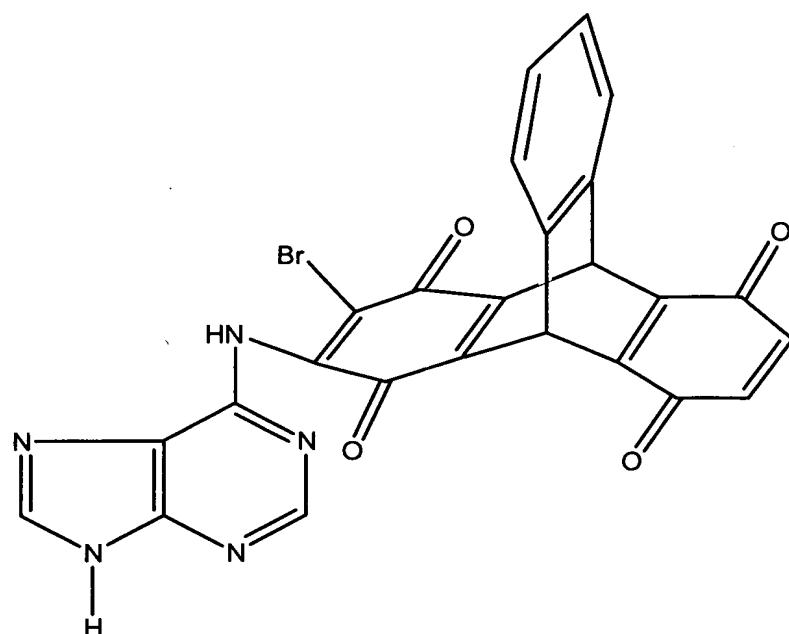
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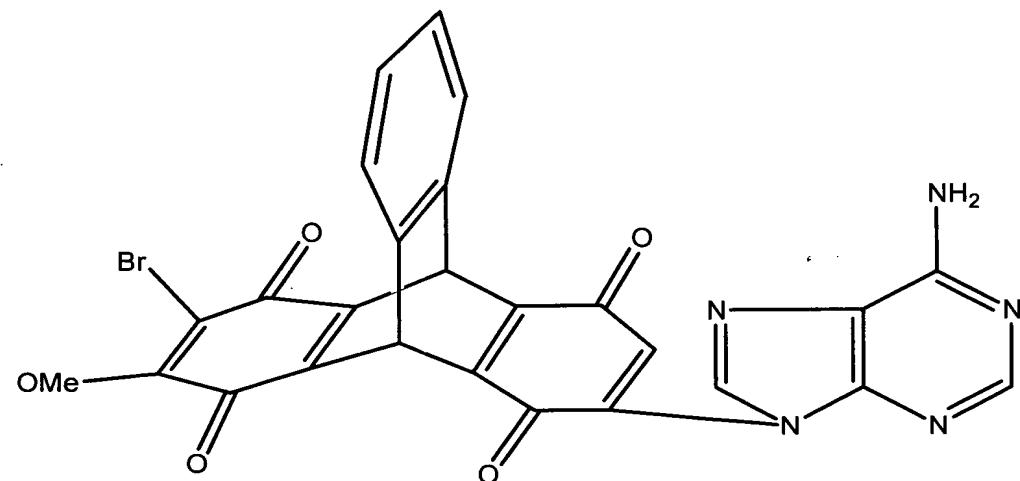
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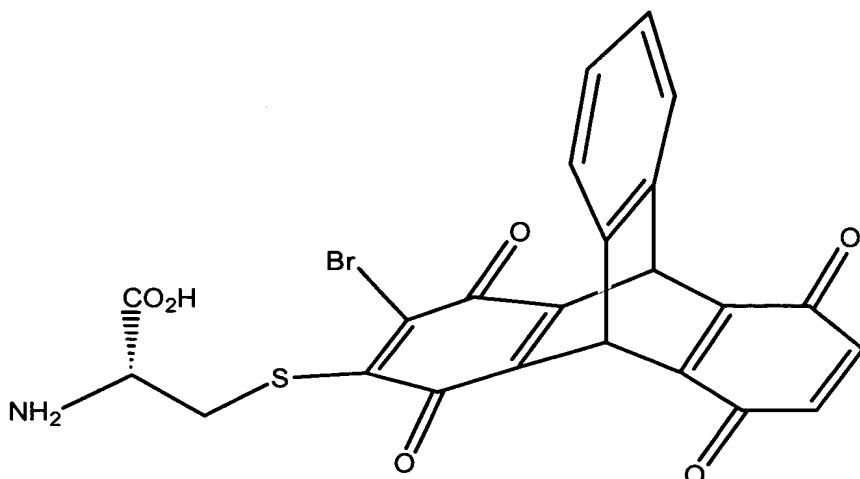


32. The compound of claim 14 having the formula:



33. The compound of claim 14 having the formula:

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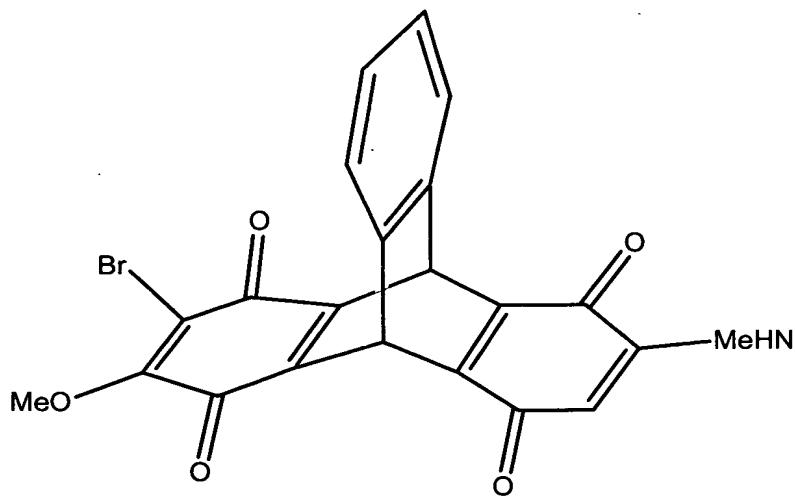
34. The triptycene analog of claim 14 having the formula:

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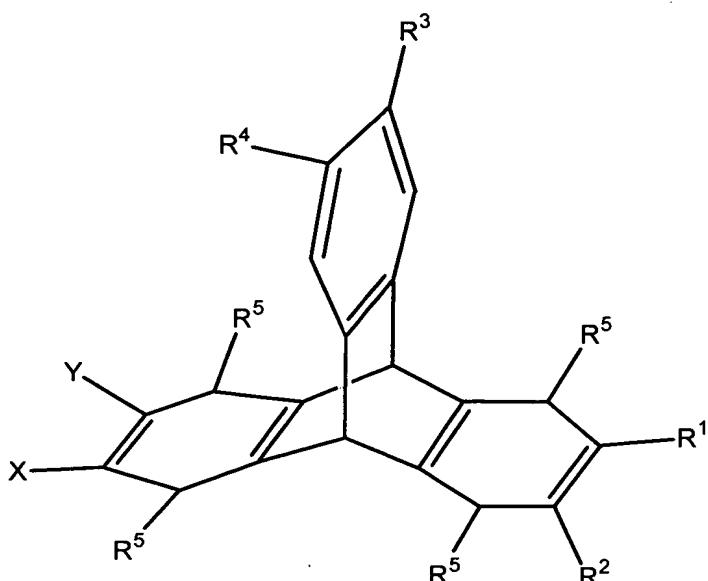
35. A triptycene analog comprising a compound of formula:

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wherein X is -NW(CW₂)_nZ, where the Ws are independently selected from the group consisting of: H, C1-C8 alkyl, and C1-C8 alkenyl; n is an integer from 1 to 8; and Z is selected from the group consisting of: R, COR, COOR, CONR₂, OOCR and NRCOR;

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Y is selected from the group consisting of: halogen, C1-C8 alkyl, C1-C8 alkenyl, OR, NR₂, SR, H, COR, OCOR and NRCOR;

R and R¹⁻², are independently selected from the group consisting of: H, OR, and hydrocarbyl;

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R³⁻⁴, independently of one another, are selected from the group consisting of: H, OR, SR, and NR₂;

R⁵, is =O; and reduced forms thereof and pharmaceutically acceptable salts of the foregoing, as well as optical isomers thereof.

36. The triptycene analog of claim 5,

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5 wherein at least one of X, Y, R¹ and R² is selected from the group consisting of: a nitrogen containing group, a water soluble group, and a sulfur containing group.

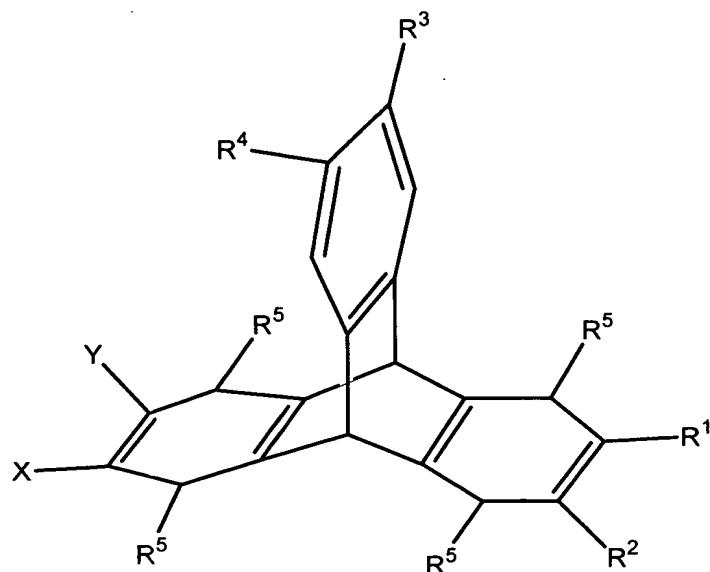
37. The compound of claim 36 wherein at least one of R²¹ and R²² is -CO²R.

38. The compound of claim 14 which blocks nucleoside transport, induces DNA fragmentation, inhibits nucleic acid synthesis, inhibits protein synthesis, decreases the proliferation of cancer cells, or decreases the viability of cancer cells.

10 39. The triptycene analog of claim 6,

15 wherein at least one of R⁵, R⁶, R⁷ and R⁸ is selected from the group consisting of: a nitrogen containing group, a water soluble group, and a sulfur containing group.

20 40. A method of making a nitrogen-containing compound of claim 14, comprising: reacting a triptycene derivative of formula:



wherein

R³⁻⁴, independently of one another, are selected from the group consisting of: H, bromine, R, SR and NR₂;

R⁵, independently of other R⁵'s, is selected from the group consisting of: =O, and =N - OH, and = CHR;

Y is Br, and X is -OR;

R and R¹⁻² are independently selected from the group consisting of: H, OR, and hydrocarbyl; and reduced forms thereof; with a primary or secondary amine.

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41. A method of inhibiting nucleoside transport, inducing DNA fragmentation, inhibiting nucleic acid synthesis, inhibiting protein synthesis, decreasing the proliferation of cancer cells or decreasing the viability of cancer cells comprising administering an effective amount of a compound of claim 14, 35, 36 or 39 to a patient.

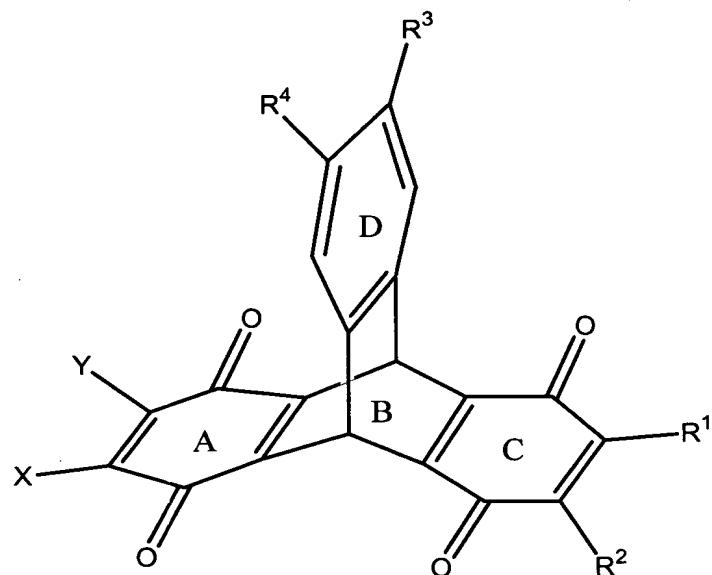
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42. A method of treating cancer in a host, comprising administering to said host a therapeutically effective amount of a compound of claim 14, 35, 36 or 39 for an effective time.

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43. A triptycene analog of formula:

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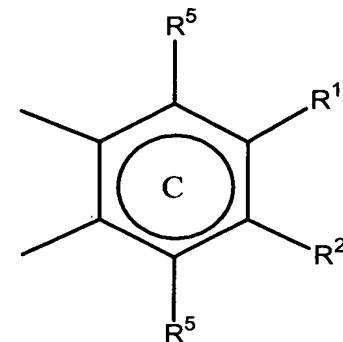
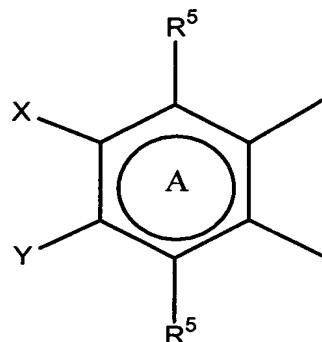


and the reduced forms thereof, wherein in said reduced forms, either ring A or ring C or both is reduced to

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or

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wherein all but one of X, Y, R¹ and R² is independently H, C1-C6 alkyl, C1-C6 alkenyl, OR, SR or NR² wherein each R is independently H or C1-C6 alkyl and the other R¹ or R² is a solubilizing group; and each R⁵ is independently H, C1-C6 alkyl or OR.

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44. The triptycene analog of claim 43, wherein the solubilizing group is of the formula: NR(CR₂)_nX wherein X is a sugar, R, COR, COOR, CONR₂, OOCR and NRCOR; R is independently selected from the group consisting of: H, C1-C8 alkyl and C1-C8 alkenyl; n is an integer from 1 to 8.